



# INVESTOR MEETING 2013

*November 21, Santa Clara, CA*



# Accelerating the Data Center Transformation

**Diane Bryant**

*Senior Vice President & General Manager  
Data Center Group*

**INVESTOR MEETING 2013**

*November 21, Santa Clara, CA*

**Rise of the Digital Service Economy**

**DIGITAL SERVICES**

**CONSUMER**

**BUSINESS**

**VERTICAL**

**DEVELOPER**

**Cloud**

**Analytics**

**Employee Productivity**

**Enterprise Mobility**

**Transportation**

**Medical**

**Retail**

**Education**

**Finance**

**Utilities**

**Landline**

**Cellular**

**Health**

**Productivity**

**Banking**

**Shopping**

**Entertainment**

**Social Networking**

**Personal Cloud**

**Other names and brands may be claimed as the property of others.**

**Rise of the Digital Service Economy**

**DIGITAL SERVICES**

**BUSINESS**

Cloud  
Analytics  
Employee Productivity  
Enterprise Mobility

**CONSUMER**

Social Networking  
Entertainment  
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Personal Cloud  
Health  
Productivity  
Banking

**NETWORKS**

Landline  
Cellular

**DEVELOPER**

Utilities

**VERTICAL**

Transportation  
Medical  
Retail  
Education  
Finance

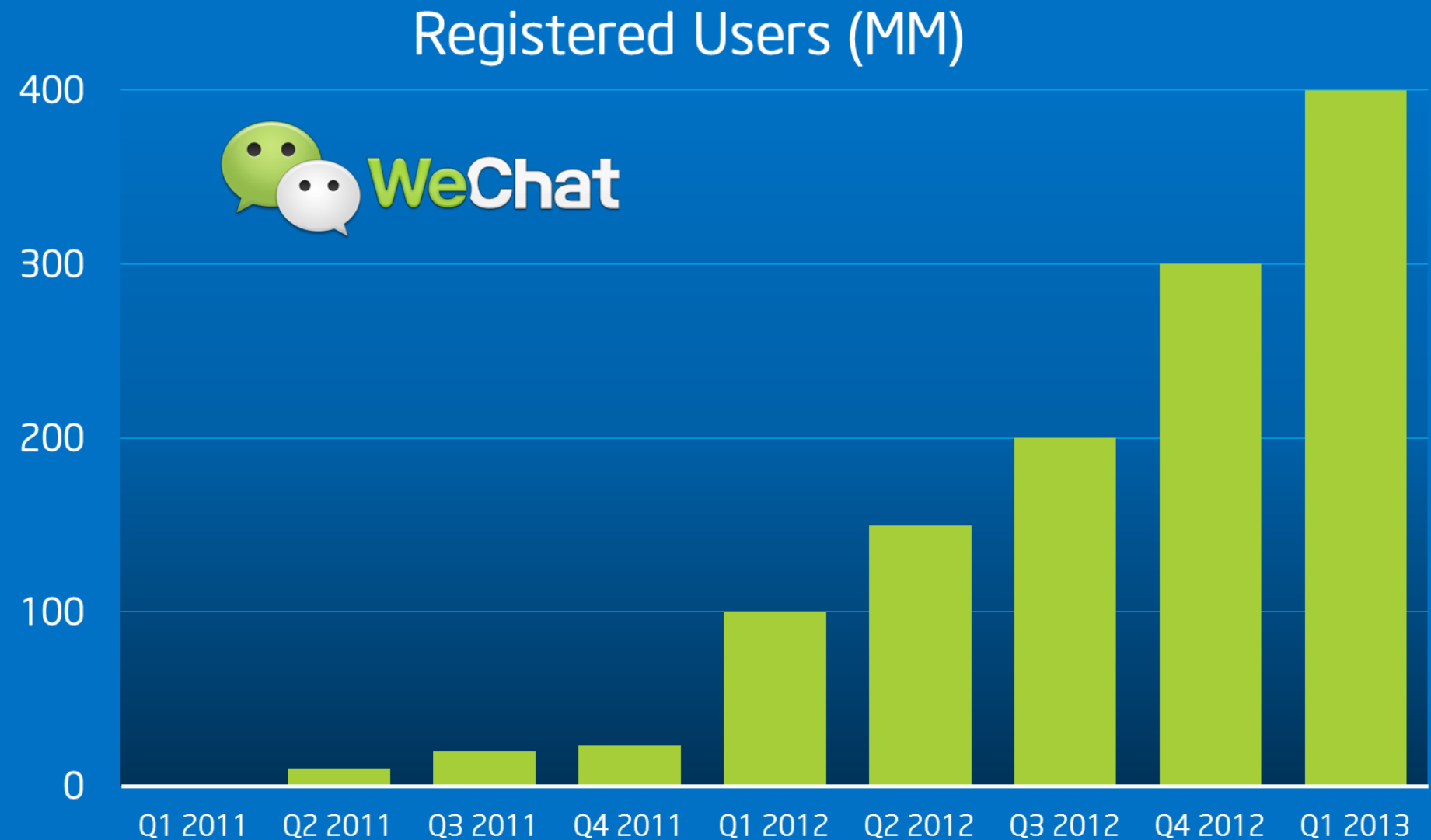
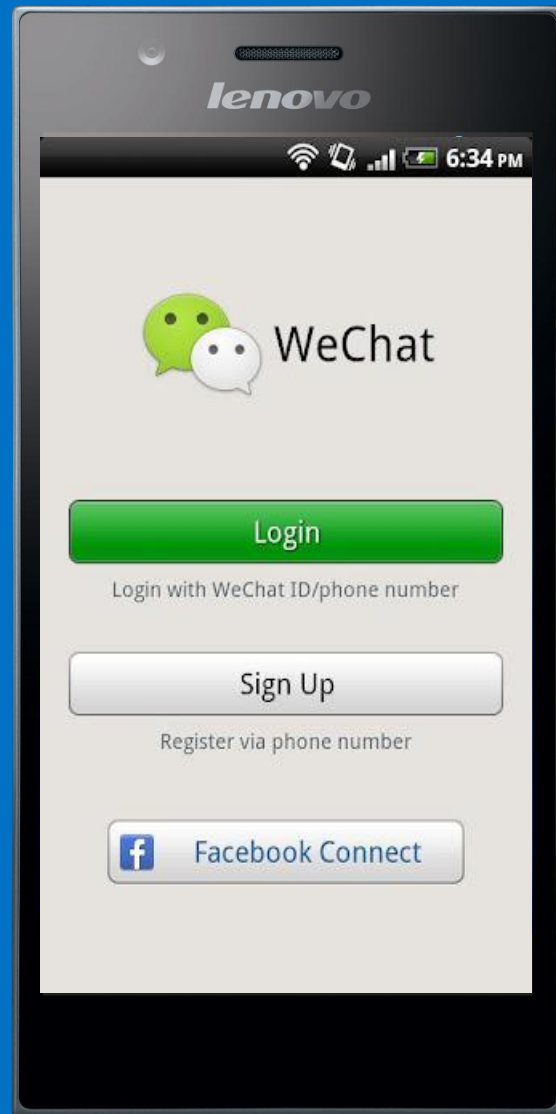
**Logos and Brands:**

- Business:** IBM Endpoint Manager, Microsoft Office 365, Salesforce, SAP, KPOK, EMC<sup>2</sup>, Windows Azure, Amazon web services, Telkom Indonesia, UFIDA 用友软件, TATA, kt, iWork, Active Cloud.
- Consumer:** VK, Cyworld, Facebook, G+, Instagram, Renren, Qzone, Orkut, VEVO, Naver, Yandex, Netflix, Youku 优酷, 300day.com, Letv 乐视网, Hulu, ST English 11 English, Nexen, YouTube, Fancy, Angry Birds, Farm Heroes, InetNetwork, Amazon.com, Mynta.com, Snapdeal, Lazada, Flipkart, Mercado Libre, Tumblr, Pinterest, Tmall.com, Airbnb, Mail.ru, Idea, Google, Bing, Yahoo!, Zopo, LendingClub, PayPal, Pinger, Talk, Line, M-Pesa, KICK STARTER, Baidu 百度, Dum, kt, KPN, Sina 新浪微博 weibo.com, DEMO Hour 点名时间, China unicom 中国联通, China Mobile 中国移动通信 CHINA MOBILE, Claro, SK telecom, TIM, T-Mobile, Verizon foundation, Airtel, Akamai, Sprint, Fostly, Vodafone, Telkomsel, O2, Megafon, At&t.
- Networks:** T-Mobile, Verizon foundation, Airtel, Akamai, Sprint, Fostly, Vodafone, Telkomsel, O2, Megafon, At&t.
- Developer:** Github Social Coding, Windows Azure, Jigsaw, MIT OCW, StackExchange, </dream.in.code> More Than Just Answers - Community Learning.
- Vertical:** Tulip making it possible, TELUMap, Airware, Hichina, Axiom, LivingSocial, Groupon, EdX, Khan Academy, Coursera, Udacity, Siemens, Fidelity Investments, E\*Trade, Village88, Fujitsu, Indosat.

\* Other names and brands may be claimed as the property of others.

# Digital Services Scale Rapidly...

*From 0 to 400 million users in 2 years*



# ... and Drive Unprecedented Economic Results

## *China's "Single's Day" (11/11) = 3X US Cyber Monday Sales*



**\$5.7 BILLION IN SALES**  
&  
**188M TRANSACTIONS**  
*in One Day*



# Virtuous Cycle of Computing

... and so on



SERVICES

DATA CENTER



DEVICES

SERVICES



# Connected Devices: *Depend on Intel-Powered Data Centers*



## SMARTPHONES

**~400 DEVICES**  
*drives*  
**1 SERVER<sup>1</sup>**



## CONNECTED FACTORY TOOLS

**~40 DEVICES**  
*drives*  
**1 SERVER<sup>2</sup>**



## MEDICAL WEARABLE DEVICES

**~100 DEVICES**  
*drives*  
**1 SERVER<sup>2</sup>**



## DIGITAL SIGNS

**~20 DEVICES**  
*drives*  
**1 SERVER<sup>2</sup>**

1: Intel and 3<sup>rd</sup> party analysis  
2: Intel estimate based on various end user proofs of concepts  
\* Other names and brands may be claimed as the property of others.

## A yellow traffic light pole with two sets of lights, overlooking a multi-lane highway with cars. The pole is in the foreground, and the highway is in the background. The lights are yellow and rectangular. The highway has multiple lanes with white dashed lines. There are several cars on the highway, including a silver car in the foreground and a red car further back. The background shows a green field and some trees.



# 250 Storage Systems



# Forecast: 19 Billion Connected Devices by 2016<sup>2</sup>

1: Intel estimate based on smart traffic installation in China  
2: Intel and 3<sup>rd</sup> party analysis  
\* Other names and brands may be claimed as the property of others.



# Data Center Overview

Enterprise  
IT



Cloud Service  
Provider



Telco Service  
Provider



HPC



Server



Storage

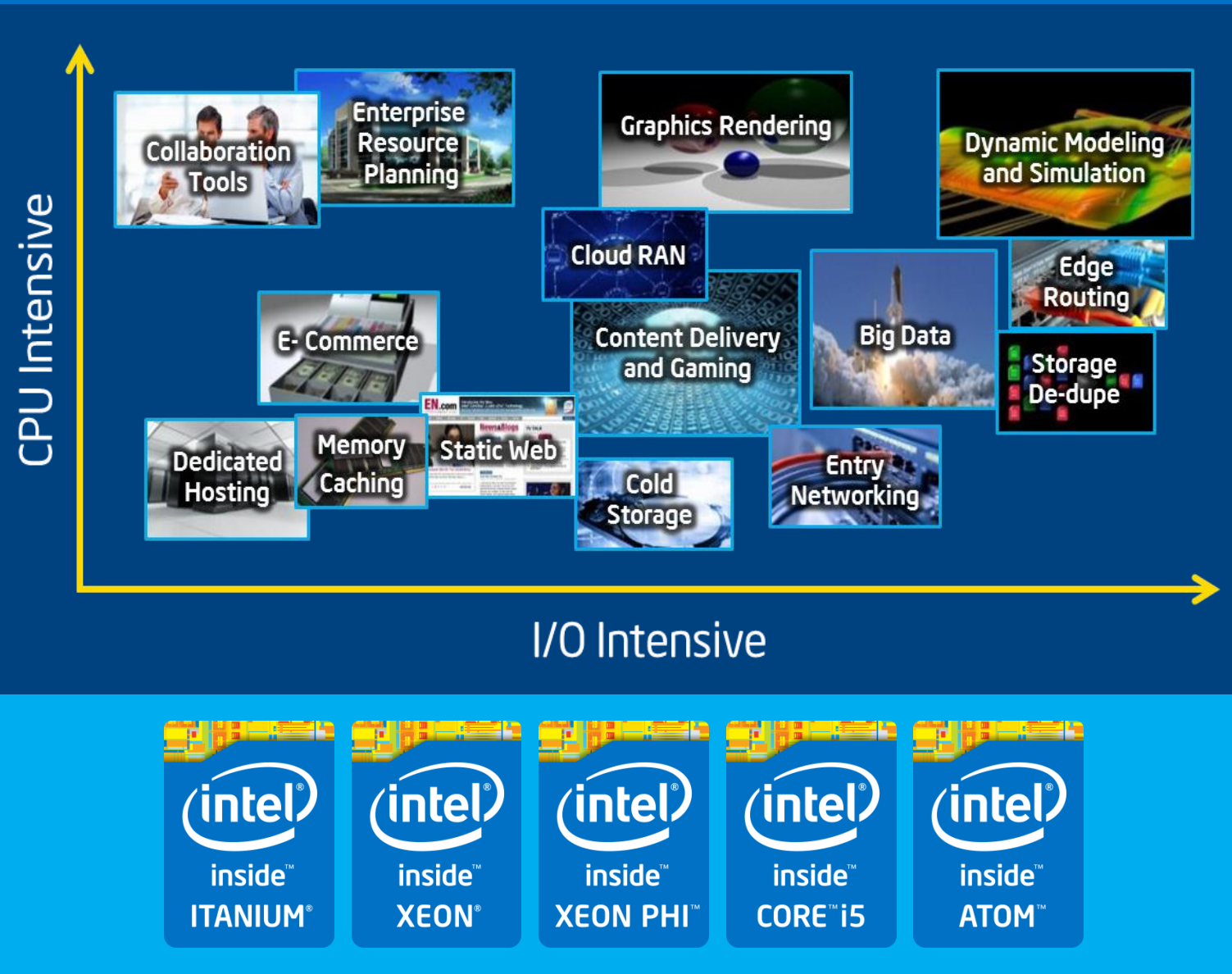


Network



# Our Strength: Workload Optimization

## *Spanning Server, Storage, and Network*



### Since Last Year:

>40 segment-optimized SKUs launched  
15 customer-tailored SKUs delivered

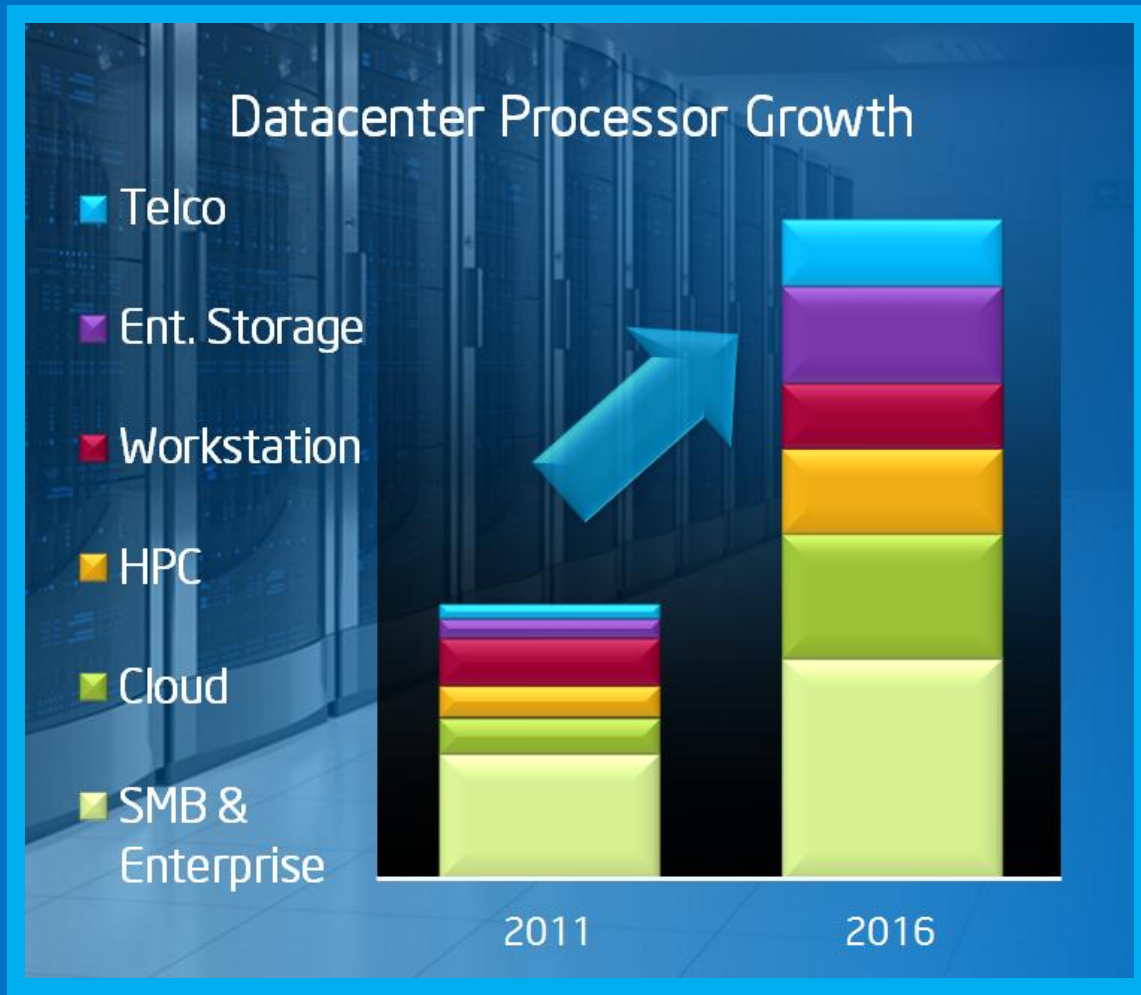
2<sup>nd</sup> gen Intel® Atom™ SoC  
for data center

Intel® Xeon® processor based SoC  
plans announced

>100 CPUs Covering all Data Center  
Workloads

# Data Center Growth: *What We Told You*

## 2011 Investor Day Commit



		<u>Revenue CAGR</u>		Drivers
		Original Forecast '11-'16	Actual '11-'13	
Cloud	37%	46%	New services build-out + value of performance + share of wallet	
HPC	14%	20%	Market growth in supercomputing & commercial HPC + MSS gain + higher ASPs	
Telco	21%	20%	4:1 workload consolidation onto more robust Xeon® processor for TCO gains	
Enterprise	13%	-1%	GDP slowdown + server virtualization matured	
Total	15%	8%		



# Data Center Forecast

## 2013 - 2017

Workstation

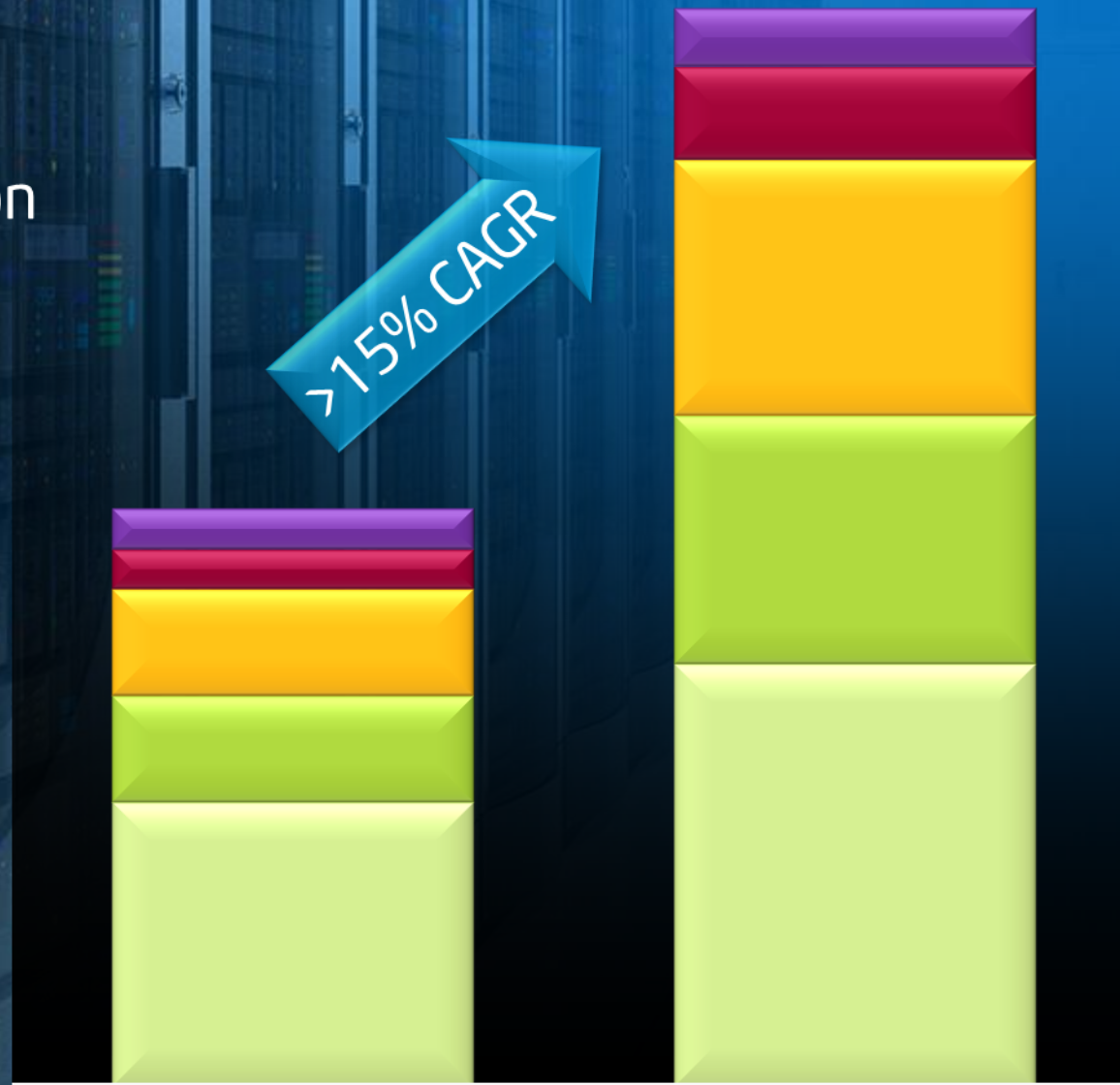
Telco

HPC

Cloud

Enterprise

>15% CAGR



2013

2017

### Segment Revenue Forecast

*Cloud, HPC, Telco*

**GROWTH**

**>20%**

*Enterprise*

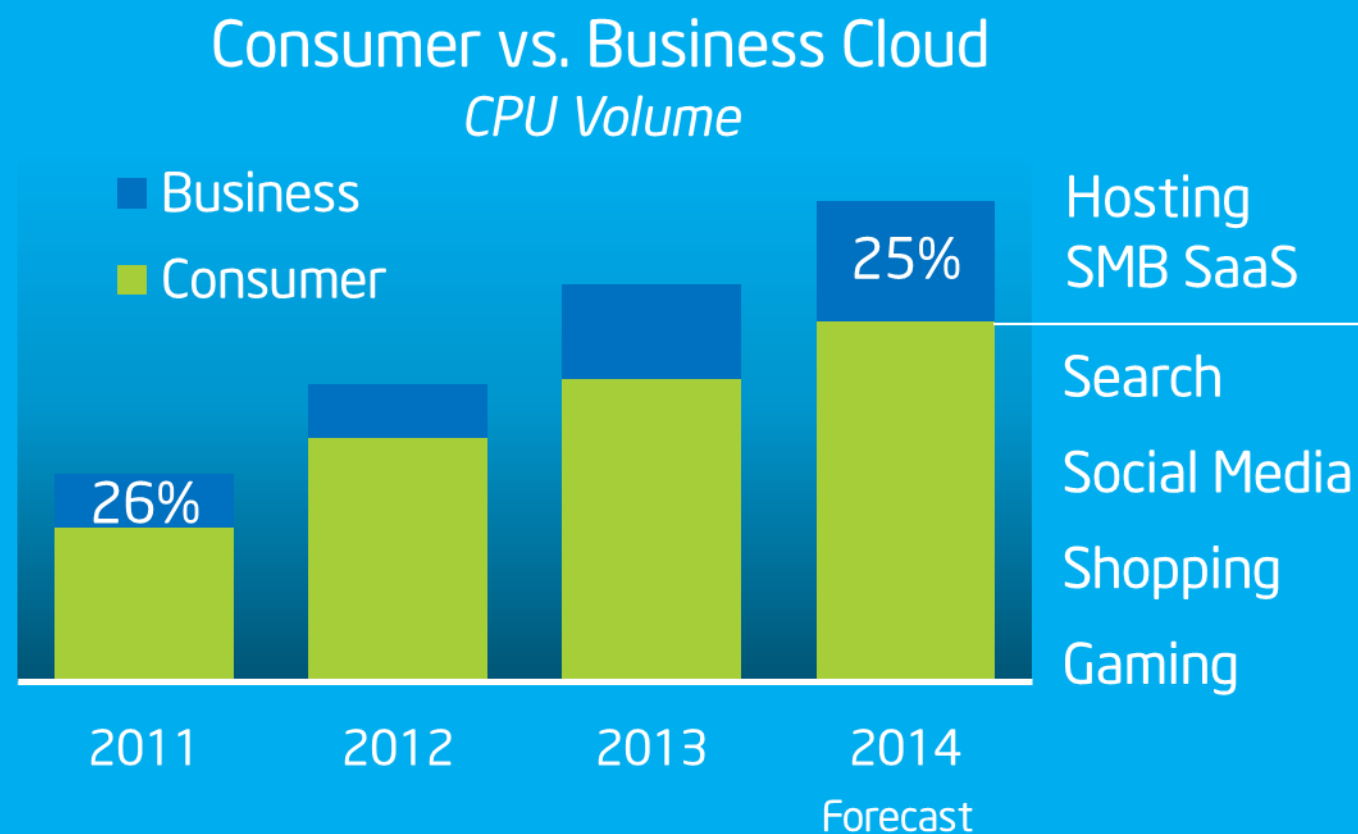
**GROWTH**

**8%**



# Cloud: *Growth Drivers*

## Cloud: 75% of Growth from Consumer Services



## Cloud SPs Valuing Intel Performance & Tech

**6 of 7 Top**

*Customers bought "higher bin" CPUs vs. prior year*

**30% Higher Attach**

*of Intel platform technologies vs. other segments*

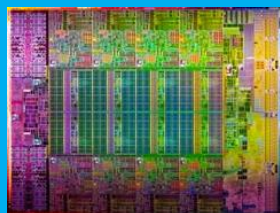


# Cloud: *Intel Advantage*

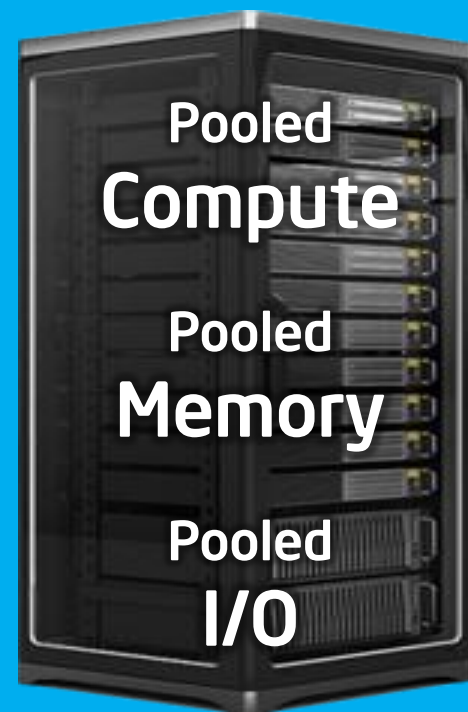
## WORKLOAD OPTIMIZATION *Server, Storage and Network*



## Silicon Customization



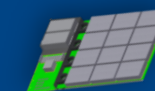
## RACKSCALE ARCHITECTURE *Greater Flexibility & Efficiency for Customers*



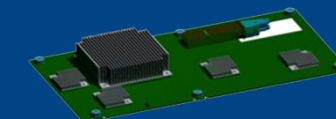
Open Network Platform



Storage-PCIe-SSD



Photonics & Switch Fabric



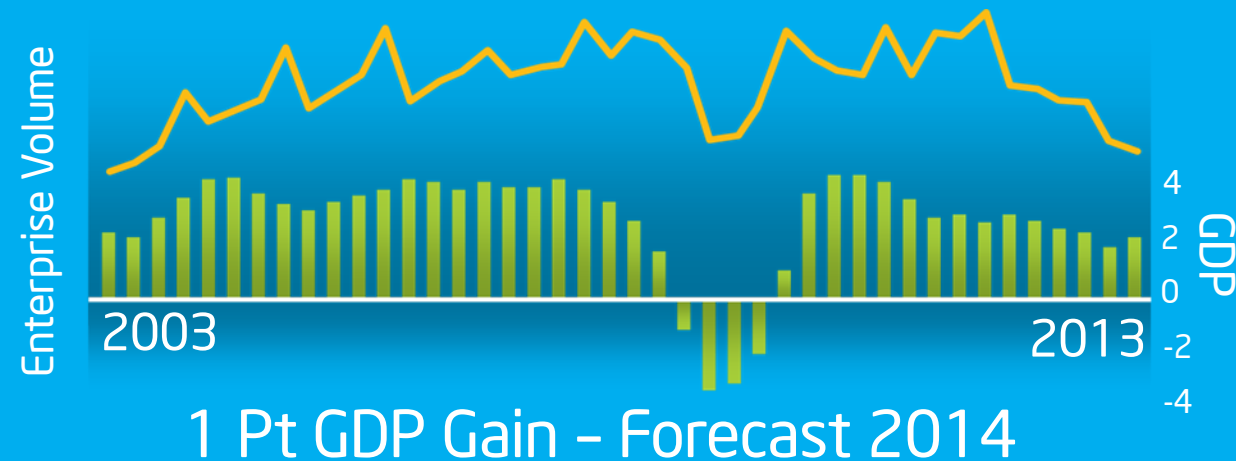
Intel® Atom™ & Xeon®



Reference Design Enabled With Intel Ingredients

# Enterprise: *Growth Drivers*

## Enterprise IT Spend Correlated to GDP<sup>1</sup>



## Private Cloud: TCO Benefit



*Transitioned to  
private cloud for  
perf / TCO*

**IT cost per VM  
as low as 50%**  
*Depending on  
workload &  
utilization<sup>1</sup>*

## Private Cloud Drives Refresh Cycle

Advanced  
Telemetry

Power Performance



Security

Utilization

VM isolation  
policy support  
geo-location

VM1



VM2



VM3



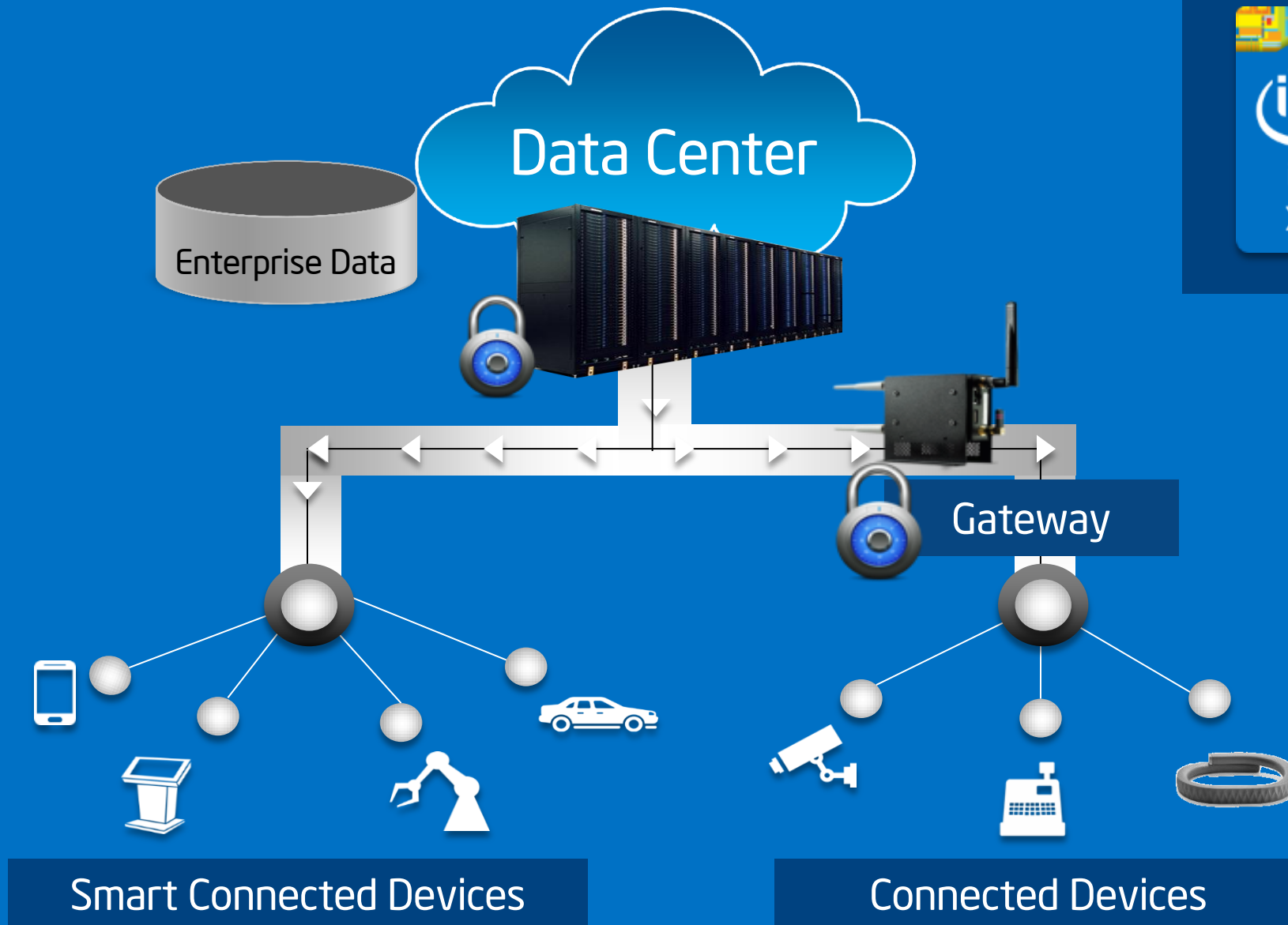
Encryption  
strong crypto



Transition to software  
defined network  
& storage



# Big Data: *Driving Enterprise Growth*



Intel® Xeon® E5 & E7  
Intel® Enterprise Edition for Lustre  
Intel® Distribution for Hadoop  
 **McAfee**  
An Intel Company



Intel® Xeon® E3  
Intel® Atom™  
 **McAfee**  
An Intel Company  
**WIND RIVER**



Intel® Core  
Intel® Atom™  
Intel® Quark  
 **McAfee**  
An Intel Company

## Consistent Architecture, IoT to Data Center



# Network: *Growth Drivers*

**Telco: Transitioning to  
General Purpose Computing**

**Across All 4 Workloads**

*Application, Control,  
Data, Signal*

**AT&T Launches  
Supplier Domain 2.0**



**SDN: Transforming Networks  
Across All Segments**

*Intel IT: SDN cuts  
provisioning time from  
**Weeks to Minutes**<sup>1</sup>*

**Open  
Standards  
Rapidly  
Emerging**

**OPEN VSWITCH**  
An Open Virtual Switch



**NFV: Virtualizing Fixed  
Functions onto Servers**

*Standards body formed  
Oct 2012*

**Now >25 carriers**

*1st specs released within  
1 year*



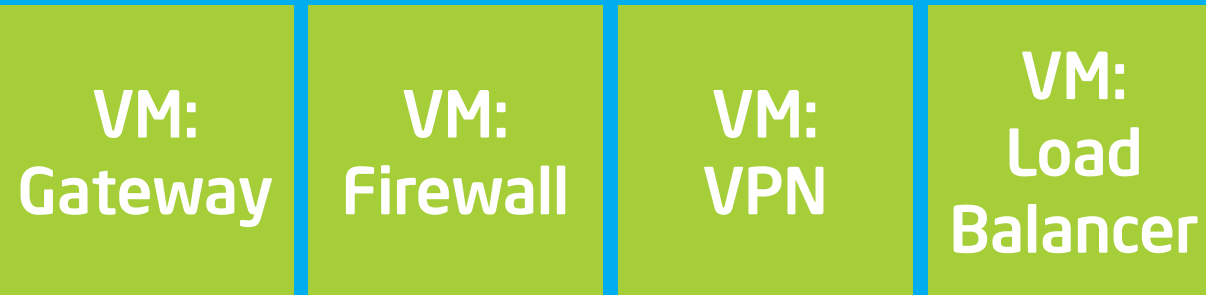
**Intel: >15 Carrier Quals of SDN / NFV in All Major Regions  
With Top System Vendors**

<sup>1</sup>: Source: Intel IT internal estimate

\* Other names and brands may be claimed as the property of others.

# Network: *Intel Advantage*

## Network Functions Now Virtualized on IA



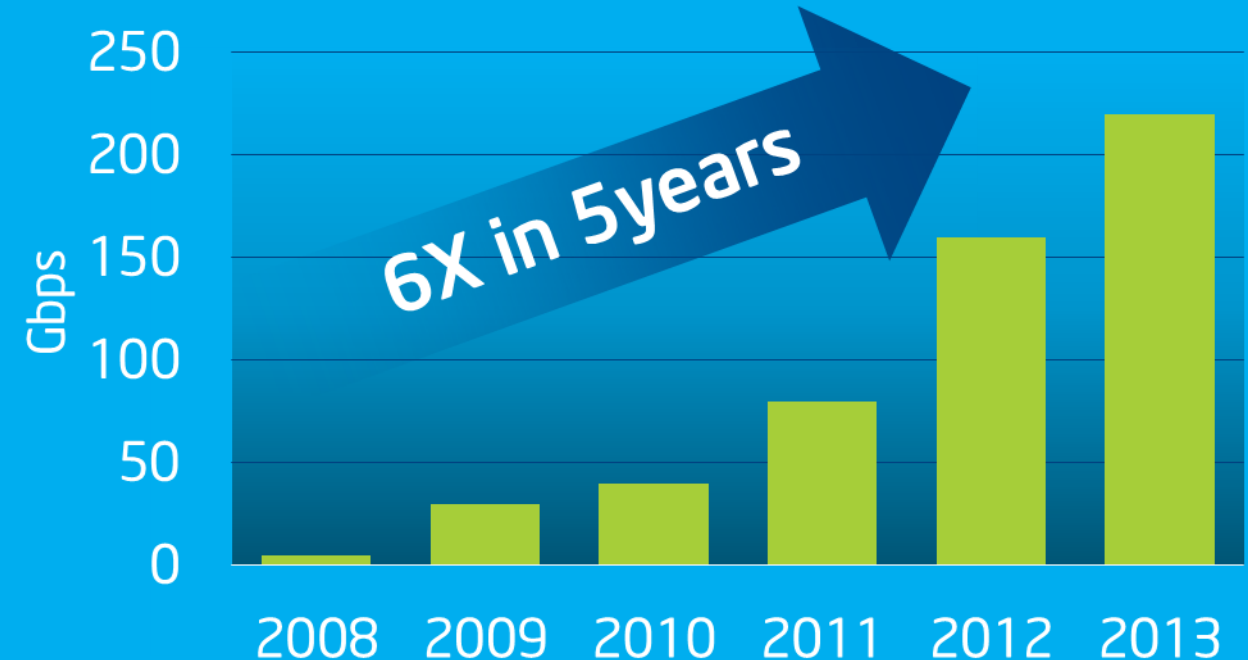
### Network Functions Virtualization



*"[Intel-based] system(s) shipping today deliver almost 200G throughput ... and in the routing/firewall world that is shocking because it replaces \$100,000 proprietary boxes."*

BROCADE 

## Xeon Delivering Disruptive Performance for Packet Processing<sup>2</sup>



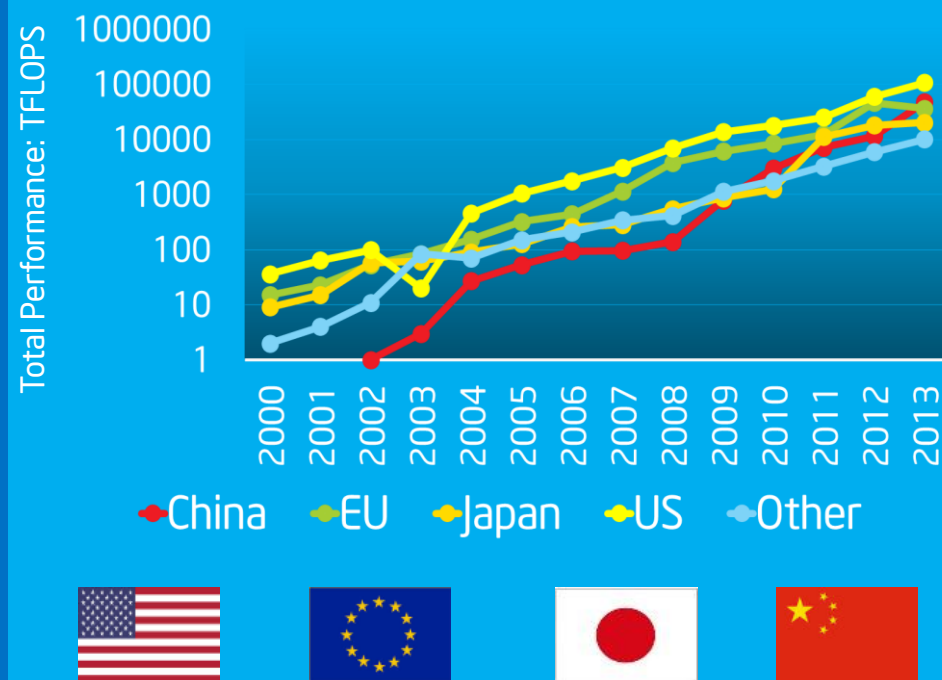
**Shift to Standards Based IA:**  
*Intel: ~5% share in a \$16B market today<sup>1</sup>*

<sup>1</sup>: Intel internal estimate

<sup>2</sup>: Intel Internal measurement of packet processing performance using Intel Xeon processors. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to [intel.com/performance](http://intel.com/performance) \* Other names and brands may be claimed as the property of others.

# HPC: Growth Drivers & IA Advantage

## Supercomputing



Top 500 FLOPs >50%  
CAGR for past decade<sup>1</sup>

## Commercial HPC



Genomics sequencing from  
7 days to 4 hours<sup>2</sup>

## Heterogeneous Computing

28% → 77%  
2011 2013

HPC customers intend to  
deploy co-processing<sup>3</sup>



#1 Share  
Of Top500 co-  
processor FLOPs<sup>1</sup>

96% MSS of new top 500 systems<sup>1</sup>  
90% MSS of HPC overall<sup>1</sup>

1: Source: [www.top500.org](http://www.top500.org)

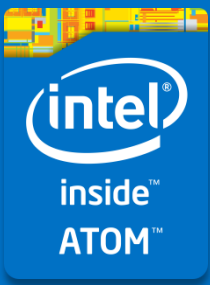
2: Intel estimate based on user results

3: Source: IDC Worldwide Study of HP End User Sites (2013)

\* Other names and brands may be claimed as the property of others.

# System Leadership for Lightweight Workloads

## Microservers, Cold Storage, Entry Network



### Leadership Roadmap



2nd Gen 64-bit Atom™ SoC,  
50+ designs wins

### Software Compatibility



Across the portfolio from  
Xeon® to Atom™

### Ecosystem Enabling



Investment  
beyond silicon

*"...the road to ARM-based servers now looks longer  
and narrower than previously thought....  
So **ARM is not likely to encroach** on Intel's  
cloud territory in any significant way soon.."*

*Rick Merrit*

**EE**Times

*"Intel's greatest differentiation... comes from its  
**unmatched software compatibility**... almost  
any application developed for a Xeon platform can  
now scale down to Intel's new SoC design."*

*Linley Gwennap*

 The Linley Group



# Intel Delivering Comprehensive Data Center Innovation

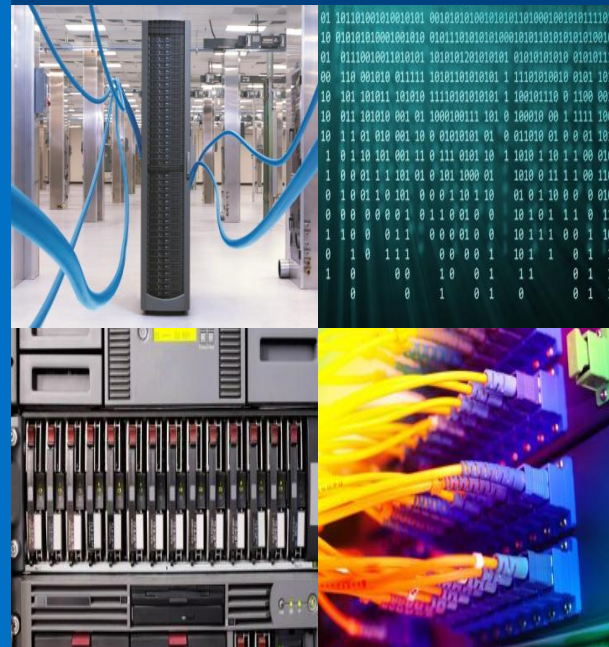
2000

Servers



2013

Servers, Storage,  
Network  
& Software



Beyond CPUs

Fabric

Silicon Photonics

Non-Volatile Memory

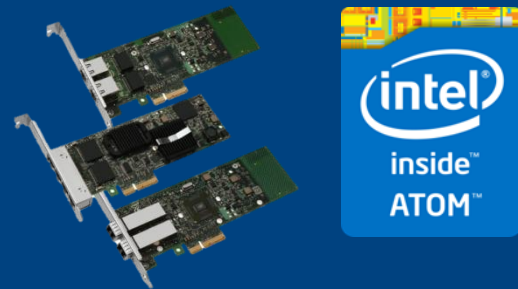
# Fabric Innovation & Integration

## *Expanding the Revenue Opportunity*

### Ethernet

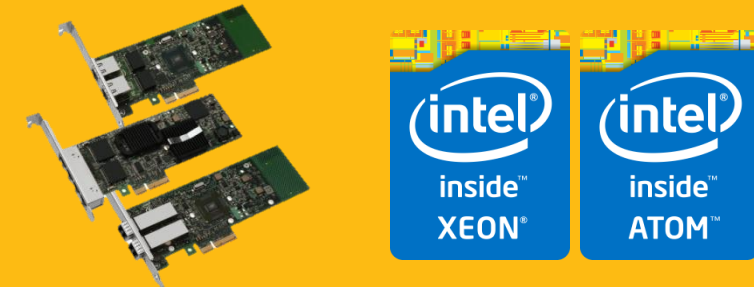
Today

Discrete & Integrated



2014+

Discrete & Integrated  
*Xeon & Atom*



### HPC Fabric

Today

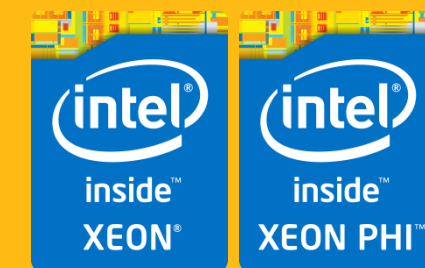
Discrete

Intel® True  
Scale  
InfiniBand



2015+

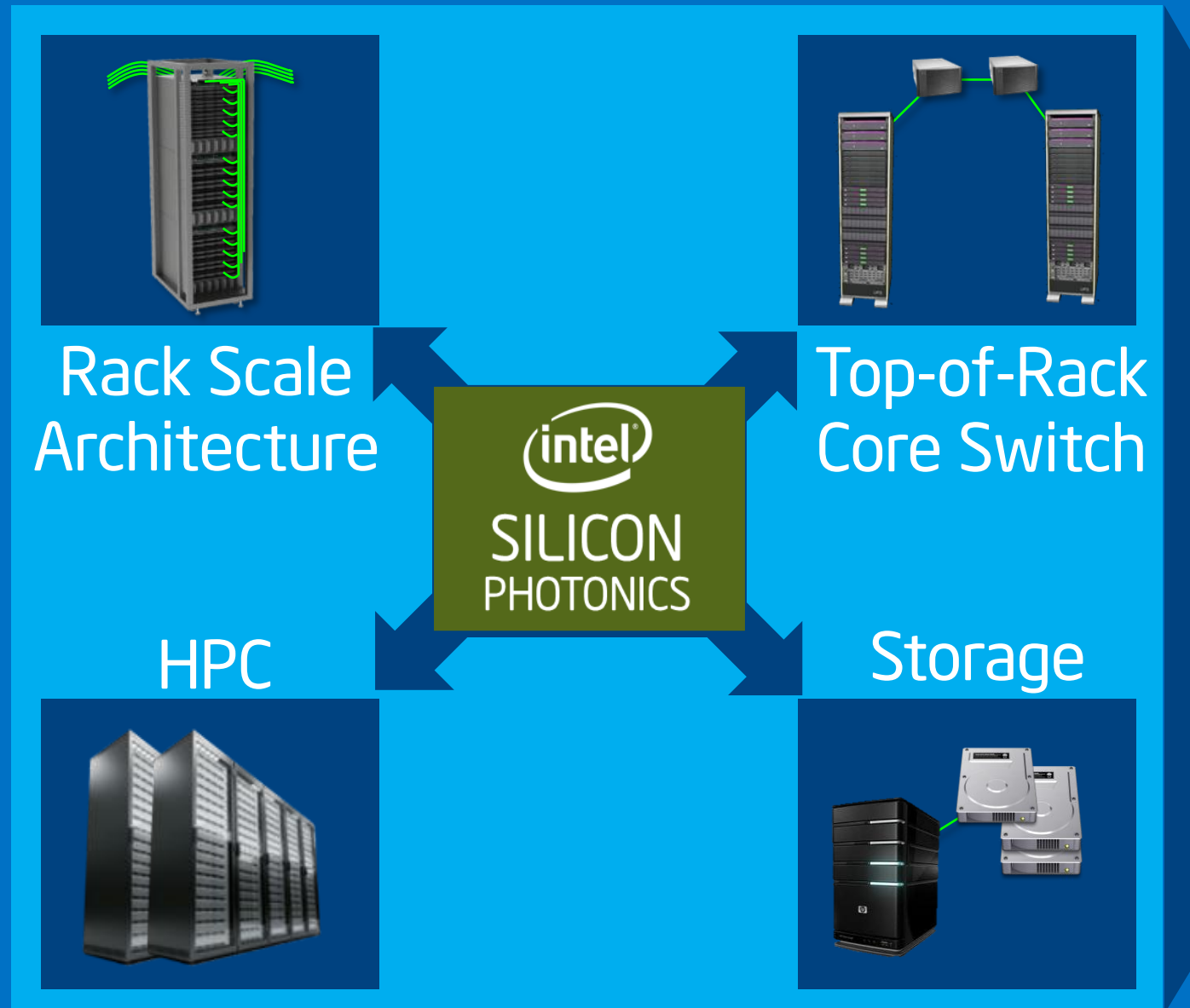
Integrated Next Gen Fabric  
*Xeon & Xeon Phi*



All products, computer systems, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice.

\* Other names and brands may be claimed as the property of others.

# Silicon Photonics



Data Center demanding faster speeds and longer distances

Copper challenged >25Gbps

Current optical challenged >100m, >25Gbps

- Bandwidth, scalability, cost

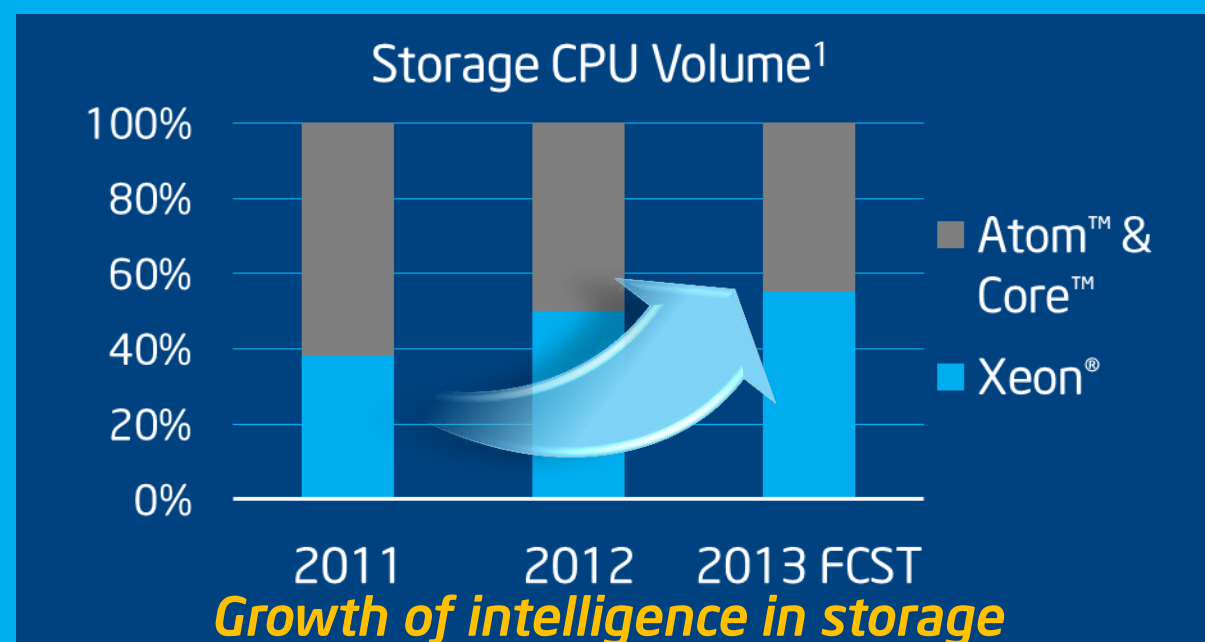
Intel Silicon Photonics

- Demonstrated 800m reach at 25Gbps<sup>1</sup>
- Improved cost, flexibility and power
- Enables higher server density

100Gbps Sampling Q3'13, Production in '14

# Storage & Non-Volatile Memory

## Software Defined Storage



Intel Storage Software & Optimized CPUs



Cache  
Acceleration  
Software



Enterprise  
Edition for  
Lustre

## Non-Volatile Memory



**Today:**

**#1 in Data Center SSDs**

2013: ~40% MSS<sup>2</sup>, ~50% growth<sup>1</sup>

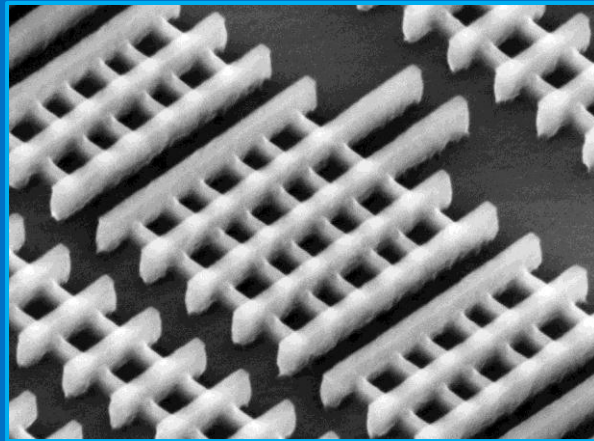
**Tomorrow:**

Redefining boundary between  
memory and storage



# Intel's Unmatched Assets

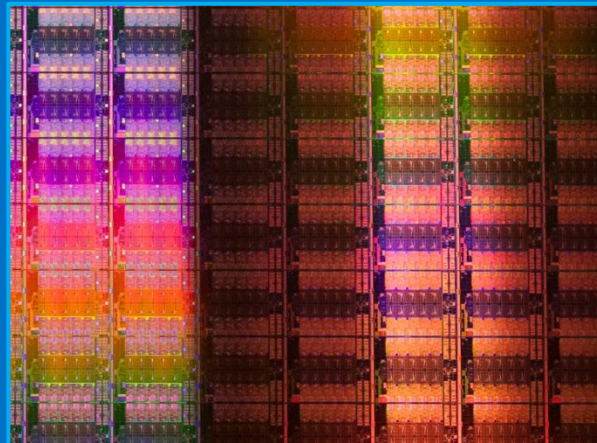
**Most Energy  
Efficient Transistors**



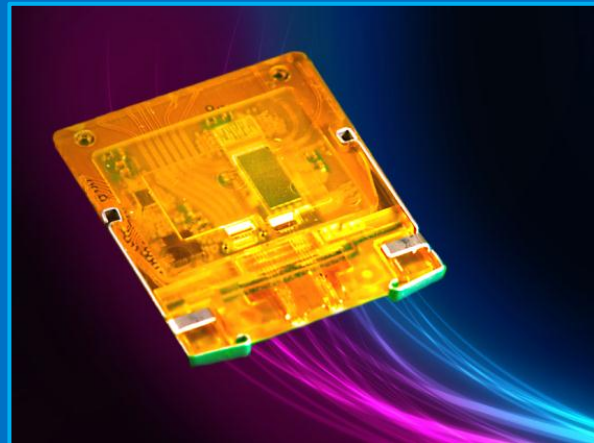
**Architecture  
Consistency**



**Software  
Compatibility**



**Workload  
Optimized Silicon**



**Technology  
Portfolio**



**Global  
Ecosystem**

# Data Center Summary

- Significant growth & change in rise of the digital services economy
- We are uniquely positioned to win
  - Double-digit growth CAGR\* through 2017
- Leadership solutions across server, storage and network

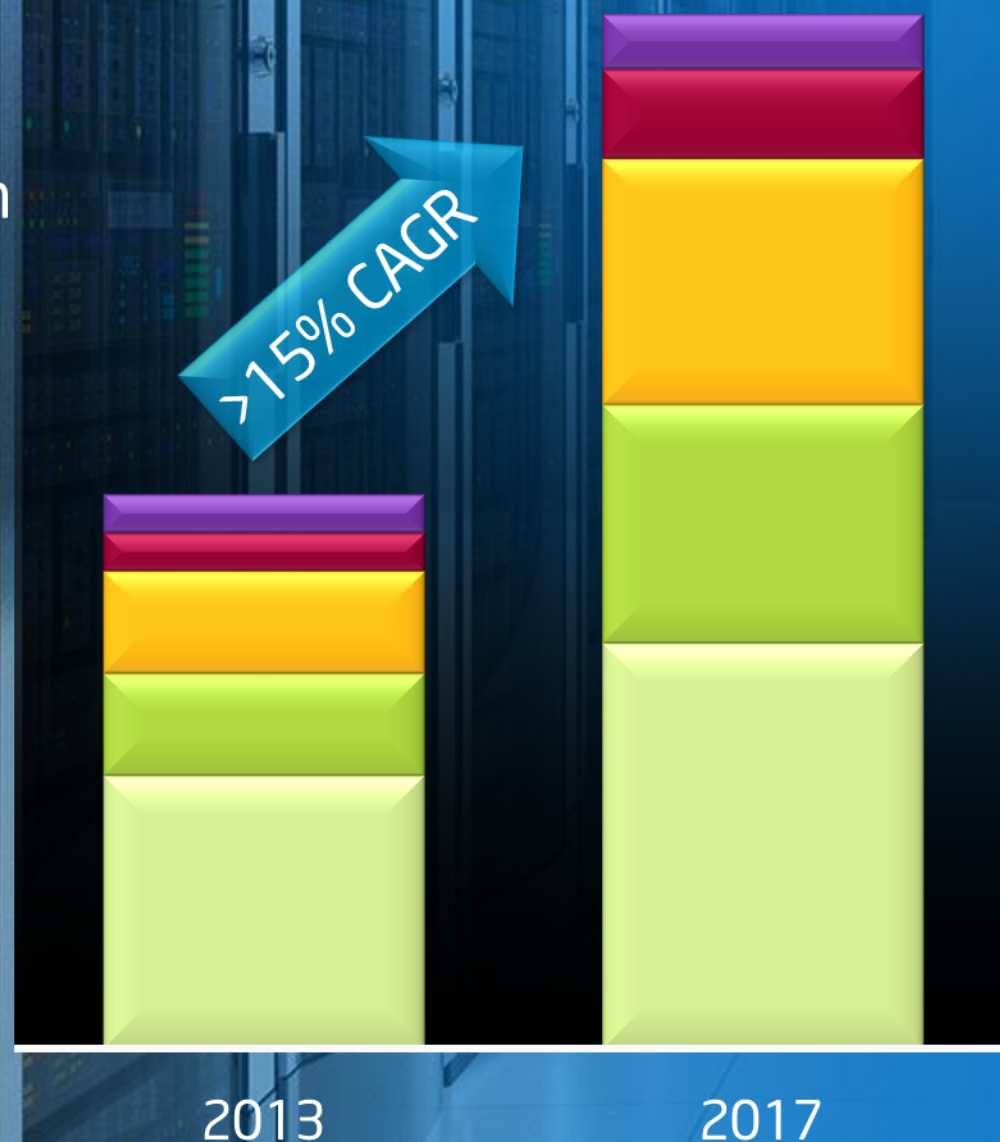
■ Workstation

■ Telco

■ HPC

■ Cloud

■ Enterprise



2013

2017



# Risk Factors

The above statements and any others in this document that refer to plans and expectations for the fourth quarter, the year and the future are forward-looking statements that involve a number of risks and uncertainties. Words such as “anticipates,” “expects,” “intends,” “plans,” “believes,” “seeks,” “estimates,” “may,” “will,” “should” and their variations identify forward-looking statements. Statements that refer to or are based on projections, uncertain events or assumptions also identify forward-looking statements. Many factors could affect Intel’s actual results, and variances from Intel’s current expectations regarding such factors could cause actual results to differ materially from those expressed in these forward-looking statements. Intel presently considers the following to be the important factors that could cause actual results to differ materially from the company’s expectations. 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The gross margin percentage could vary significantly from expectations based on capacity utilization; variations in inventory valuation, including variations related to the timing of qualifying products for sale; changes in revenue levels; segment product mix; the timing and execution of the manufacturing ramp and associated costs; start-up costs; excess or obsolete inventory; changes in unit costs; defects or disruptions in the supply of materials or resources; product manufacturing quality/yields; and impairments of long-lived assets, including manufacturing, assembly/test and intangible assets. The tax rate expectation is based on current tax law and current expected income. 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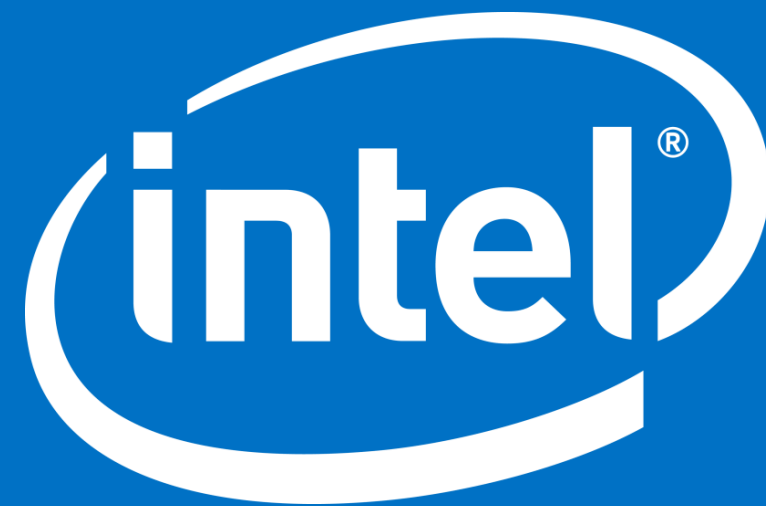
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- Intel does not control or audit the design or implementation of third party benchmark data or Web sites referenced in this document. Intel encourages all of its customers to visit the referenced Web sites or others where similar performance benchmark data are reported and confirm whether the referenced benchmark data are accurate and reflect performance of systems available for purchase.
- Relative performance for each benchmark is calculated by taking the actual benchmark result for the first platform tested and assigning it a value of 1.0 as a baseline. Relative performance for the remaining platforms tested was calculated by dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms and assigning them a relative performance number that correlates with the performance improvements reported.
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- Intel® Turbo Boost Technology: Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit <http://www.intel.com/go/turbo>
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